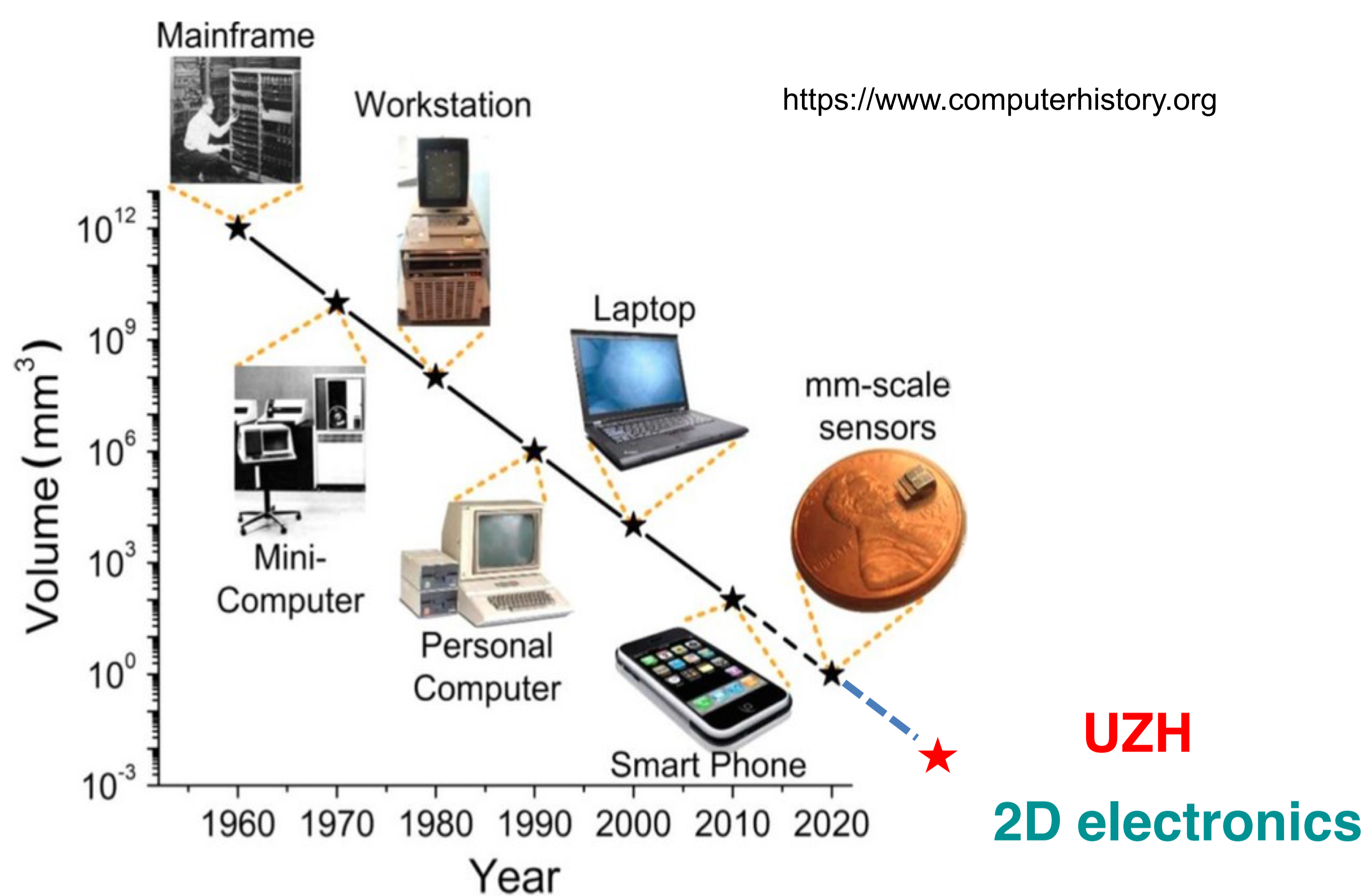


Huanyao Cun*, Adrian Hemmi*, Weichuang Lee, Jürg Osterwalder and Thomas Greber

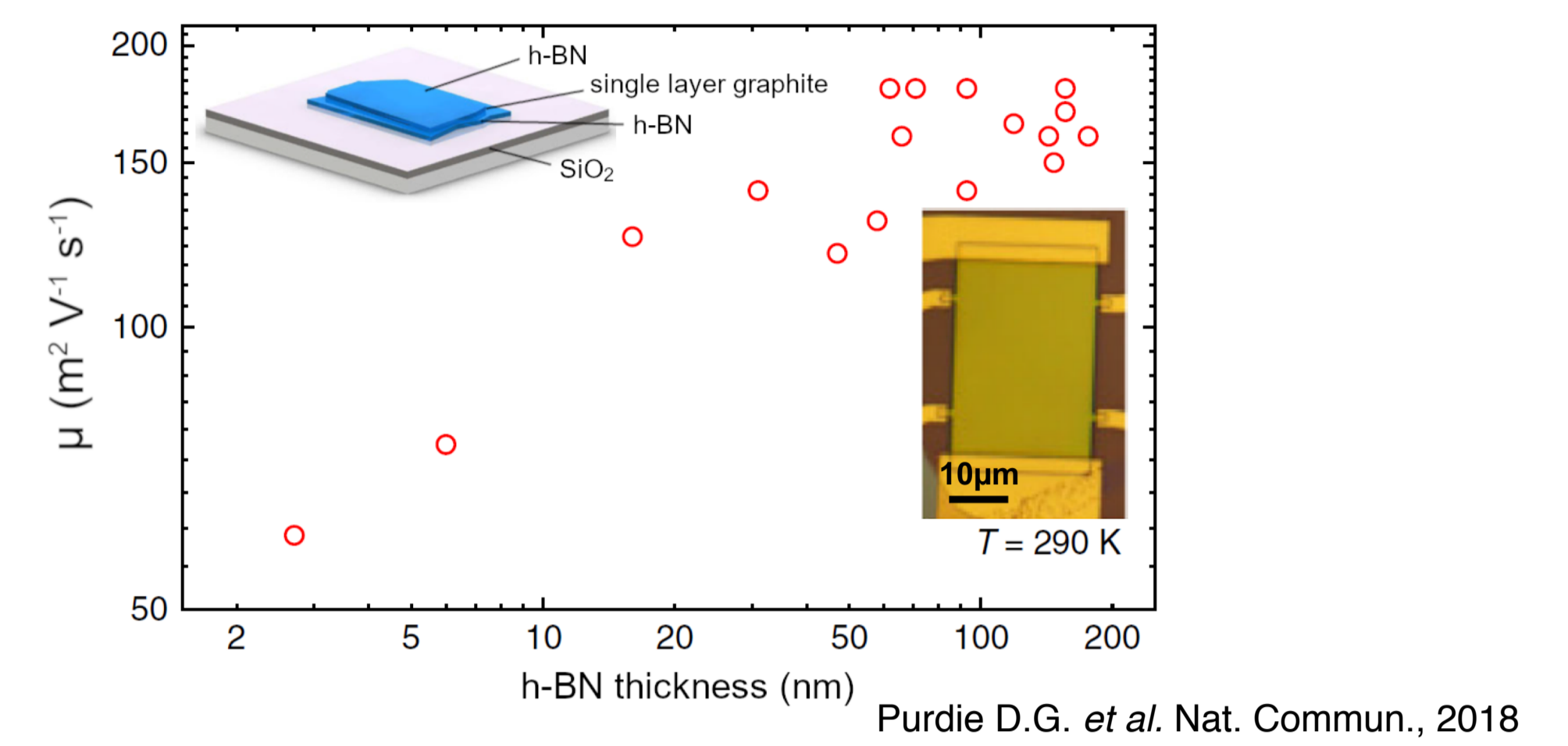
Surface Physics Group, Physik-Institut, Universität Zürich
* hycun1@physik.uzh.ch, hemmi@physik.uzh.ch

Two-dimensional (2D) materials, e.g., graphene, are wonder materials. Hexagonal boron nitride (h-BN) is a strategic 2D material because of its flexibility, transparency, strong mechanical properties and excellent chemical stability. It has huge impact on fast 2D electronics.

The evolution of computer classes



State of the art 2D electronics



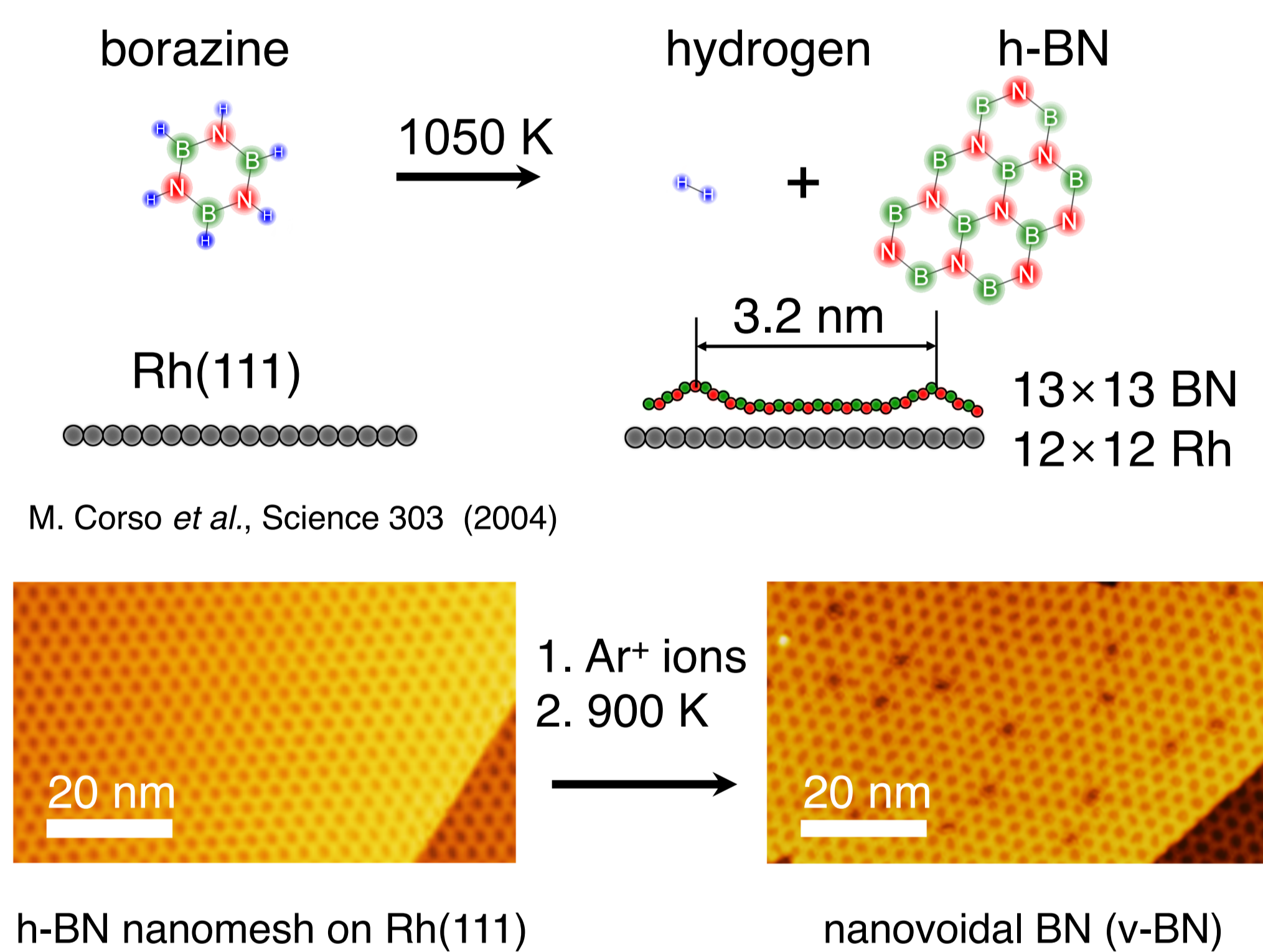
Electron mobility in 2D-hall bar geometry is 10⁵ times better than Si-based electronics



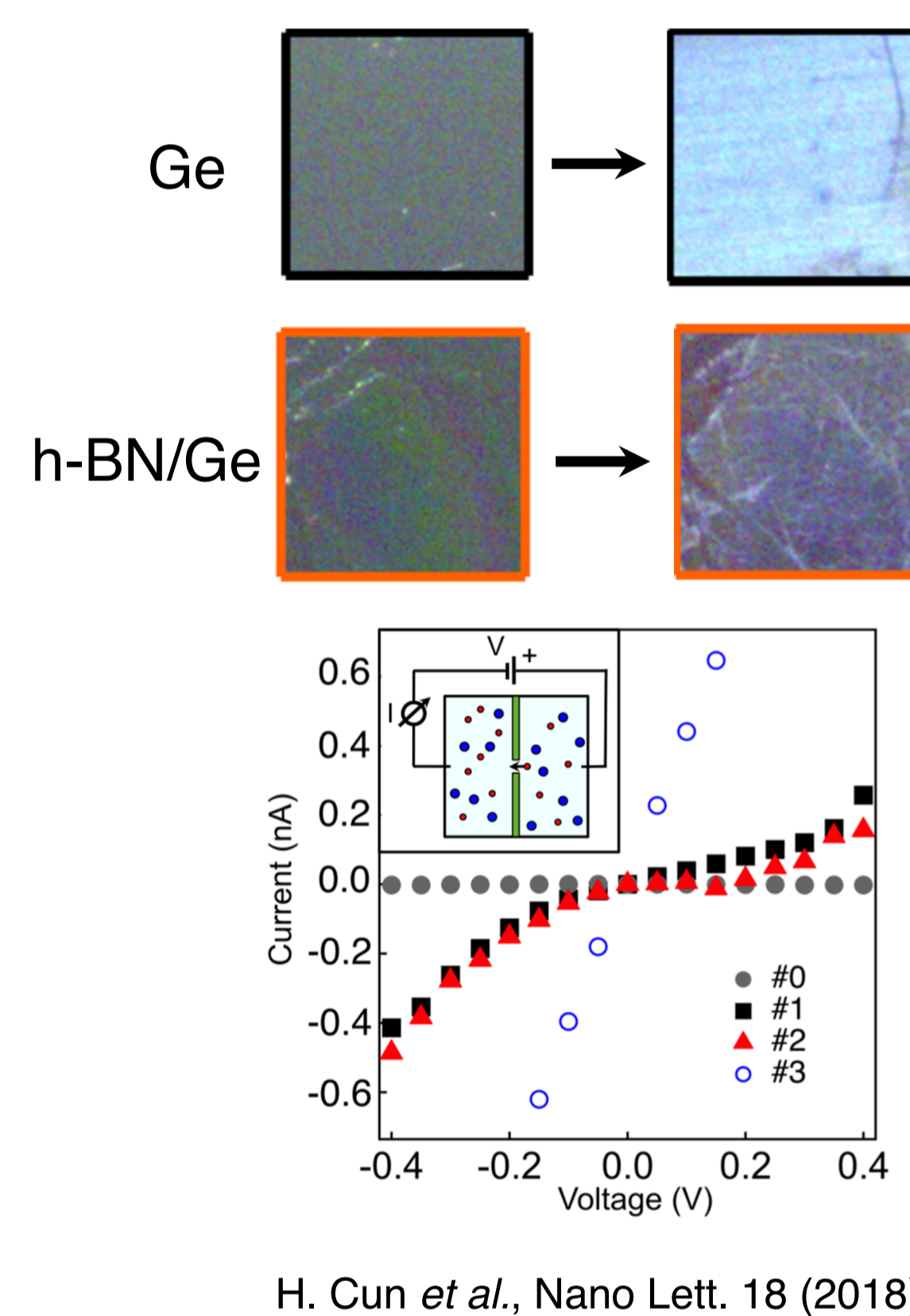
Scotch-tape method for lab-scale (~ μm) device fabrication, not suitable for industrialization.



Fundamentals of 2D materials @UZH

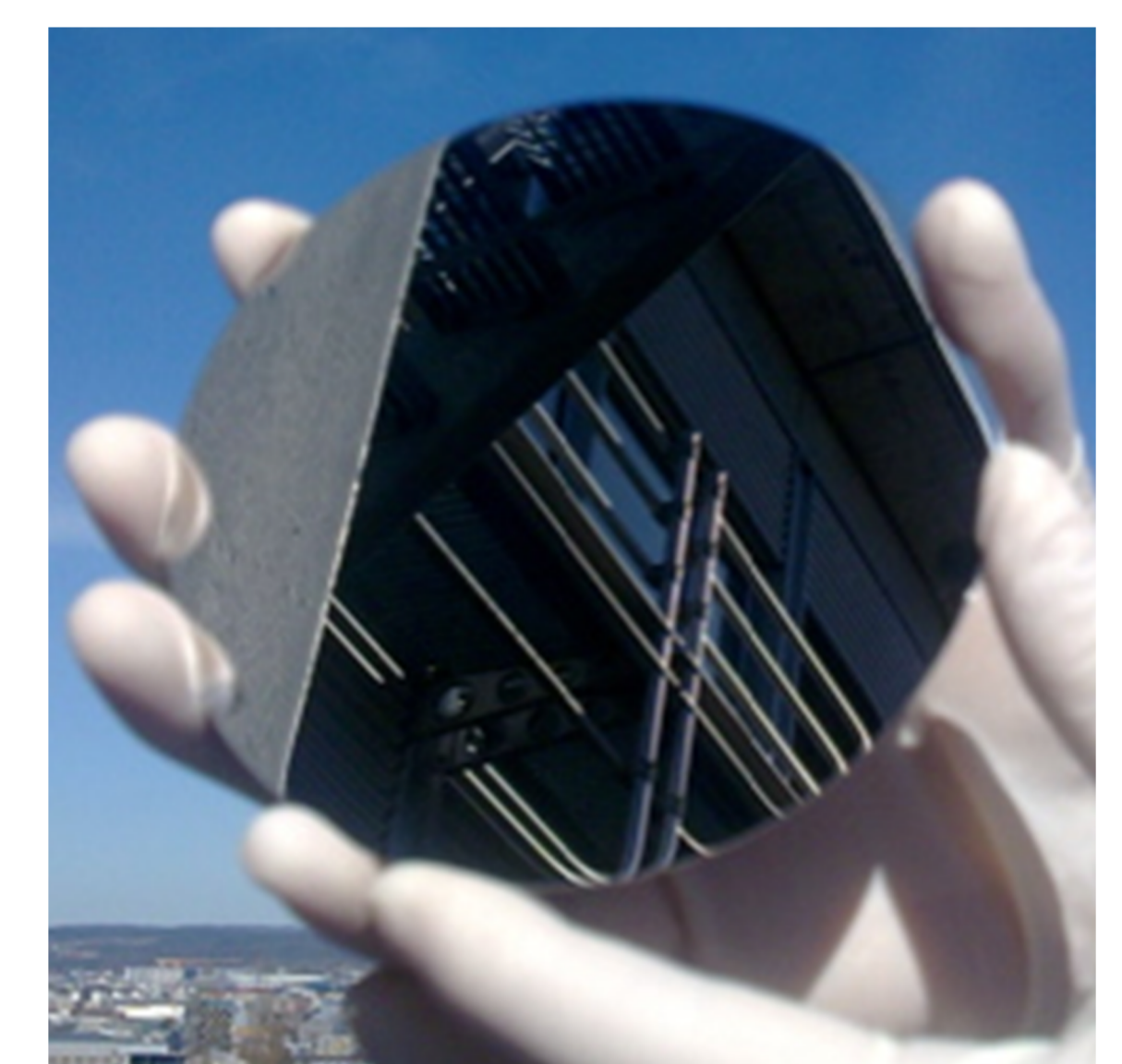


UHV-CVD surface fabrication knowledge since 1997



h-BN membranes research outside of UHV

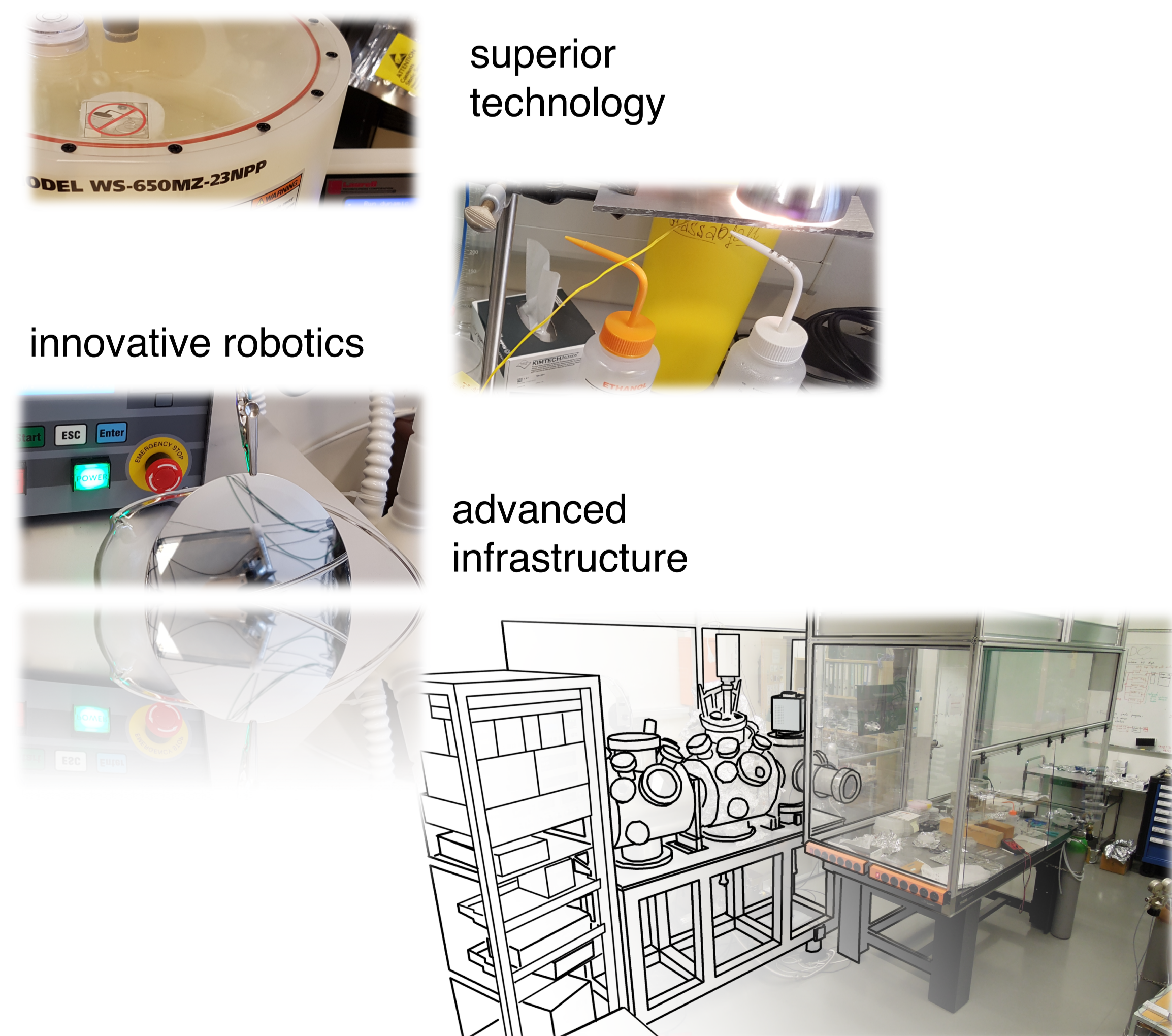
Upscaling of 2D material fabrication



A. Hemmi et al., Rev. Sci. Instrum. 85 (2014)

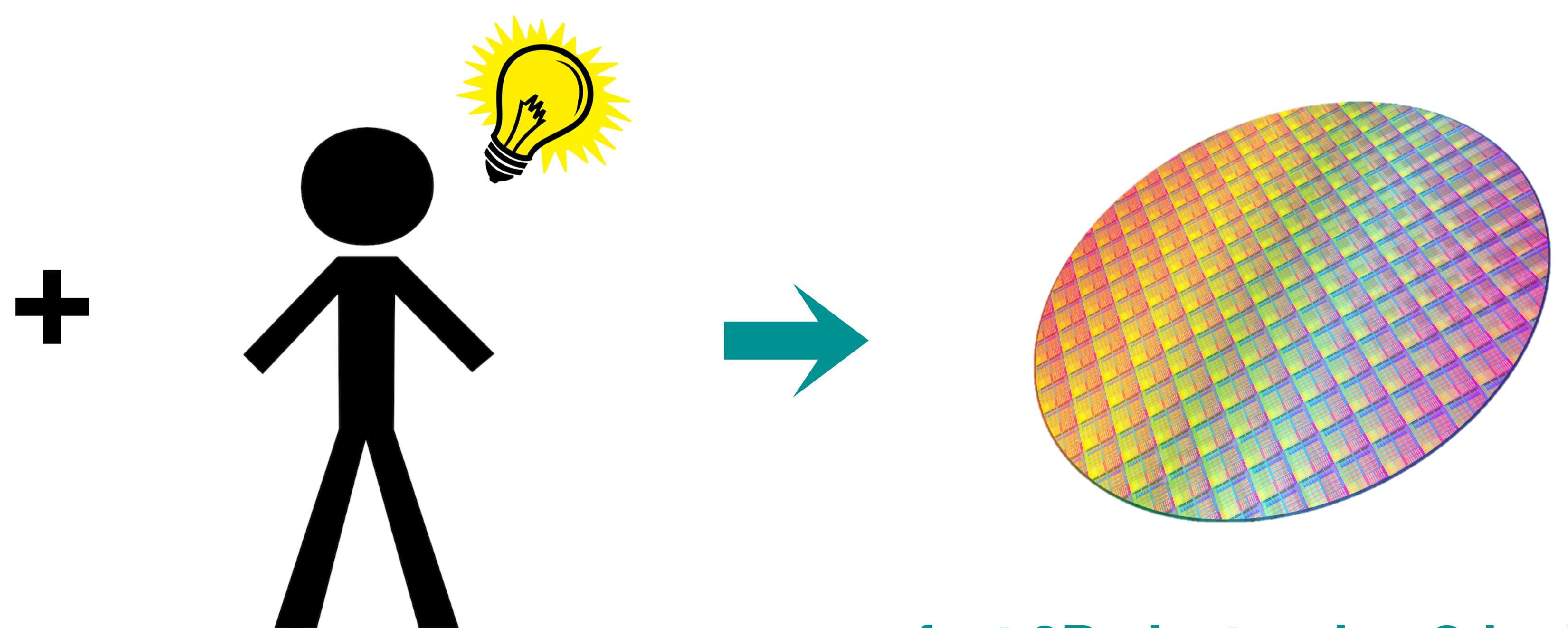
4 inch h-BN coated wafer in Zürich air

UZH 2D electronics roadmap



Projects:

- graphene/h-BN device fabrication
- wafer-scale 2D materials transfer
- nanovoidal 2D membrane applications in gas and in liquids



fast 2D electronics © by UZH

UZH students bright & creative minds